

## SOLVENT EXTRACTION AND CHARACTERIZATION OF OIL FROM AFRICAN STAR APPLE (*CHRYSOPHYLLUM ALBIDUM*) SEEDS\*

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### ABSTRACT

*African Star Apple (Chrysophyllum albidum) is one fruit of great economic value in tropical Africa due to its diverse industrial, medicinal and food uses. Its seeds have also been found to have a number of beneficial uses. In this study, oil was extracted from the seeds of Chrysophyllum albidum using normal hexane as extracting solvent. The extraction was carried out at a temperature of 65°C at 3 – 4 hours extraction time. Solvent extraction is known to be the best method of extracting oil from low oil bearing seeds. The method used is aimed at determining the percentage oil yield. At a range of 3 - 4 hours extraction time and a temperature of 65°C, the average oil yield obtained was 10.71%. The characterization was conducted to determine the physical and chemical properties of the extracted oil shows that the oil was deep red in colour, liquid at 28°C with a characteristics smell, density of 0.89 kg/m<sup>3</sup>, solidification temperature of -2°C, boiling point of 62°C, saponification value of 177.30 mg/KOH/gram, acid value of 5.20% free fatty acid value of 2.60%, peroxide value of 1.65 meq/kg, refractive index of 1.4672 at 31.2°C. These results suggest that Chrysophyllum albidum seeds may be a viable source of oil going by its oil yield. Furthermore, the studied characteristics of the oil extracted shows that it may be used for many domestic and industrial purposes in Nigeria.*

**Keywords:** African star apple, solvent extraction, refractive index, oil yield.

### INTRODUCTION

Plant seeds have been used since antiquity as sources of vegetable oil. Examples of some plant seeds which have been conventionally exploited commercially for this purpose includes soyabeans, cotton seed, groundnut, corn, palm seeds and sunflower (Ochigbo & Paiko, 2011).

Seeds of plants are a good source of food for animals, including humans, because they contain nutrients necessary for plant's initial growth, including many healthy fats, such as omega fats. In fact, the majority of foods consumed by human beings are seed-based foods. Edible seeds include cereals, legumes and nuts. Oilseeds are often pressed to produce rich oils – sunflower, flaxseed, rapeseed, sesame. Seeds are typically high in unsaturated fats and, in moderation, are considered a healthy food, although not all seeds are edible (Wikipedia, 2011).

Vegetable fats and oils are lipid materials derived from plants. Physically, oils are liquids while fats are solids at room temperature. Chemically, both fats and oils are composed of triglycerides, as contrasted with waxes which lack glycerin in their structure. Fats are made up of saturated fatty acids while oils are up of mostly unsaturated fatty acids. Although many different parts of plants may yield oil, in commercial practice, oil is extracted primarily from seeds of plants which grow in many different parts of the world. The chief importance of vegetable oils lies in their food value. Oils and

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